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A new species of genus *Eresus* from Algeria (Araneida : Eresidae)

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Abstract

A new species of the spider genus *Eresus*, family Eresidae, is described and named *Eresus algericus*. It is the fifth species of that genus described from Algeria.

Keywords: Spiders, Eresidae, *Eresus algericus*, Algeria, North Africa, Taxonomy, new species.

Introduction

During my work in revising the species of the north African eresid genus *Dorceus* C.L. Koch, 1846, a misidentified specimen (as *Dorceus fastuosus*) was examined in the Oxford University Museum of Natural History to find that it belongs to genus *Eresus* (El-Hennawy, 2002).

Among the 18 species and 7 subspecies of genus *Eresus* Walckenaer, 1805, four species were recorded from Algeria (Roewer, 1954; Platnick, 2003): *E. albopictus* Simon, 1873b, *E. cinnaberinus latefasciatus* Simon, 1910, *E. semicanus* Simon, 1908, *E. solitarius* Simon, 1873a. The specimen of UMO is completely different. Also, it is not matching with any of the known descriptions of *Eresus* species. Therefore, it is necessary to describe it as new species.

The description only depends on a single specimen deposited in the Oxford University Museum of Natural History, United Kingdom (UMO), formerly known as Hope Entomological Collection (HECO).

All measurements were taken in millimetres.

Abbreviations used: ALE = anterior lateral eye; AME = anterior median eye; Id = eyes inter-distances; L = length; PLE = posterior lateral eye; PME = posterior median eye; TL = total length; W = width.

Eresus algericus new species

(Figs. 1-4. Table 1)

Type Material: Holotype: Male: Algeria: unknown locality, (UMO) B.510, t.-, Lord Walsingham, 1903.

Diagnosis: Male of this species is recognized by the shape of the terminal element of conductor of the palpal organ.

Etymology: The species name is a noun in apposition taken from the type locality.

Description: Male (Holotype): TL 10.79; Cephalothorax L 6.06; Cephalic part: L 3.90, W 4.15; dark (blackish) reddish brown, covered by black hairs, with two white hair spots just behind the posterior median eyes. Thoracic part: L 2.16, W 3.65; dark (blackish) reddish brown, covered by black hairs, with thick band of white hairs on the outer border. Cephalothorax L : W anteriorly = 1.46; L : W posteriorly = 1.66.

Eyes: posterior medians (PME) largest; three times larger than anterior medians (AME); posterior laterals (PLE) less than double the diameter of the AME; AME and ALE equal. Eye measurements (diameters and interdistances): AME 0.16, ALE 0.16, PME 0.48, PLE 0.26, AM-AM 0.36, AL-AL 2.96, PM-PM 0.72, PL-PL 2.60, AM-AL 1.16, AM-PM 0.16. (Id PME : Id AME = 2.00; Id PLE : Id ALE = 87.84).

Chelicerae: with strong big boss; covered by dense black hairs, especially beside the fang; there is one tooth against the fang. Sternum (L 3.32) and coxae: reddish brown, covered by sparse black hairs. Labium (L 1.60) and maxillae (L 1.60): reddish brown, covered by sparse black hairs, except the distal extremity is white.

Pedipalps: covered by black hairs, except two prolateral parts on patellae and tibiae, covered by white hair; no apophyses. Palpal organ (Figs. 1-3): terminal element of conductor is hook-like shaped.

Legs: covered by black hairs, except the distal parts of patellae, tibiae, and metatarsi which are covered by white hairs, and a few white hairs dorsally on the femora. Metatarsus IV: without calamistrum.

Table 1: Legs measurements (mm)

Leg	I	II	III	IV
Femur	3.40	3.60	3.60	4.60
Patella	1.80	1.68	1.80	2.32
Tibia	2.60	2.20	2.00	3.20
Metatarsus	3.00	2.40	2.52	3.32
Tarsus	1.80	1.48	1.60	1.60
Total length	12.60	11.36	11.52	15.04

Relative length of legs 84 : 76 : 77 : 100. Leg formula IV-I-III-II.

L leg I : L cephalothorax = 2.08.

Spination pattern: ventrally: several on tarsi I-IV, nearly pro- & retro-laterally; few on metatarsi I-IV; some on tibiae (distal ends); none elsewhere.

Abdomen: L 5.98; covered by black hairs; its outer border with white hairs from above except a small area at the front of the abdomen. There are four small oval spots without hair in the anterior half of the abdomen, followed by two transverse lines of white hair; the anterior line is intersected by a small area of black hair in the middle; the posterior line is entire (Fig. 4); ventrally covered by black hairs, except the place of the bipartite cribellum and the creamy white large area above the book-lungs.

Female: Unknown.

Distribution: Only known from Algeria, without definite locality.

Figs. 1-3: *Eresus algericus* n.sp. Right male palp.

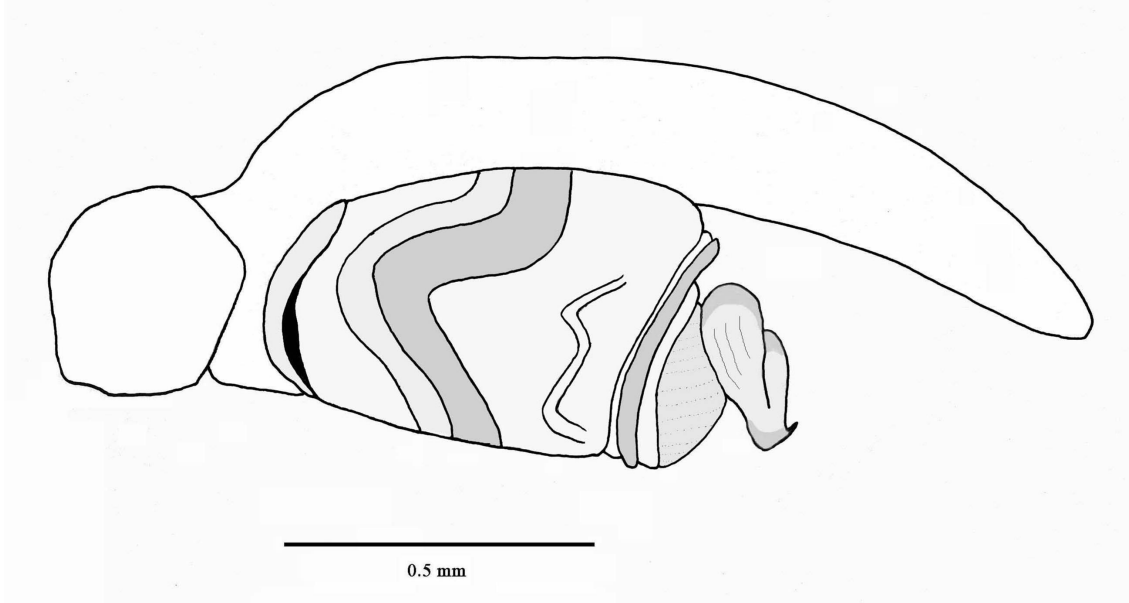


Fig. 1. Retrolateral view.

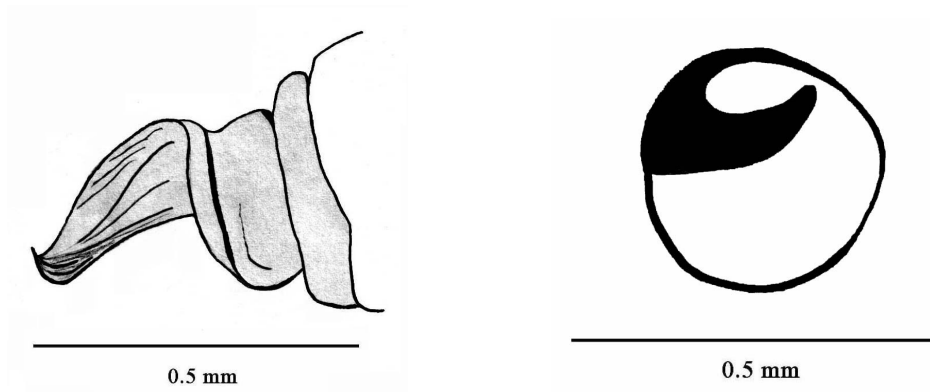


Fig. 2. Prolateral view of tip of conductor. Fig. 3. Ventral view of tip of conductor.

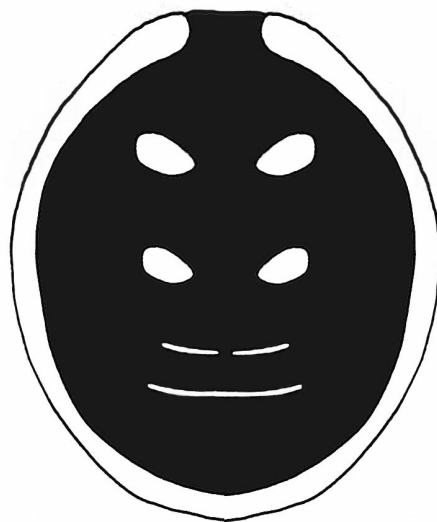


Fig. 4. *Eresus algericus* n.sp. Abdominal pattern.

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Studies on some biological aspects of *Theridion melanostictum* O.P.-Cambridge, 1876 (Araneida: Theridiidae)

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Abstract

The theridiid spider *Theridion melanostictum* was reared in laboratory at 28°C and 70-80% R.H., feeding on the two-spotted spider mite *Tetranychus urticae* or the green aphid *Brevicoryne brassicae*. The female had five spiderling instars while the male had only four. The life cycle of *T. melanostictum* was longer when the spider fed on *T. urticae* (about 57.9 and 63 days) than feeding on *B. brassicae* (about 43.6 and 59.7 days for male and female respectively). The female longevity and total number of egg sacs/female were higher when feeding was on *B. brassicae* than when it was on *T. urticae*, with an average of 4.5 and 2.8 egg sacs/female respectively. It was observed that the female daily rate of food consumption was greater than that of the male. Notes on feeding and mating behaviour are included.

Keywords: Life cycle, Fecundity, Feeding, Spiders, Theridiidae, *Theridion melanostictum*, Egypt.

Introduction

Biological control involves the use of natural enemies to control pests, but it is not possible to characterize a universal effective natural enemy for biological control (Huffaker *et al.*, 1977). Putman (1967) and Helle & Sabelis (1985) reported that members of Theridiidae and Linyphiidae are the most effective spider families as predators of mites especially *Panonychus ulmi* and species of genus *Bryobia*. Family Theridiidae includes 2208 species which belong to 80 genera (Platnick, 2003). This family is represented in Egypt by 25 species of 10 genera, one of these species is *Theridion melanostictum* O.P.-Cambridge, 1876 (El-Hennawy, 2002). In Egypt, Rahil (1988) studied the biology of the theridiid spider *Steatoda triangulosa* (Walckenaer, 1802) in relation to relative humidity, temperature and prey and Hussein, *et al.* (2003) studied some biological aspects of another theridiid, *Anelosimus aulicus* (C.L. Koch,

1838). *T. melanostictum* is the third theridiid species studied in Egypt. Its life cycle and food consumption of two kinds of prey in addition to some biological aspects were studied and recorded in this work. This study may be the first step to get use of this species in a biological control program.

Material and Methods

Females of *Theridion melanostictum* O.P.-Cambridge, 1876 with egg sacs were collected by hand from vegetable crops using camel hair brush. Each female was placed in a glass container (5 cm diameter x 9 cm depth) covered by a piece of muslin cloth hold by rubber band. The newly hatched spiderlings were transferred to separate tubes (1.5 cm diameter x 16 cm length) and daily supplied with food until completing their development. The containers and tubes were kept in an incubator at $28\pm1^{\circ}\text{C}$ and 60–70% R.H. Some biological aspects and the consumption rate of prey types were studied under these conditions.

Two kinds of prey were daily used in feeding two separate groups of spider individuals. Castor oil plant leaves, highly infested with the two-spotted spider mite *Tetranychus urticae* (Koch, 1836), were collected to infest potted beans *Phaseolus vulgaris*. Also, green aphids, *Brevicoryne brassicae* (Linnaeus, 1758), were collected from infested cabbage leaves. Mites of different stages and aphid nymphs were daily picked up, counted and introduced to spiders as continuous source of food.

Results and Discussion

Feeding behaviour

The spider always wrap the prey by its silk threads after biting it. It stays for a few minutes before attacking another prey. It takes about 4 minutes to feed on an individual of *T. urticae*, and about 7 minutes for *B. brassicae*. Sometimes the spider wrap several preys with silk and store them to feed on them after some time.

Mating behaviour

When a male of *T. melanostictum* found a female after her last moult, he moved around her and made a silk web. Courtship lasted a few minutes. Then the female stopped moving and the male moved towards her and began mating which continued for about 12 minutes using his right palpal organ. After that, the male moved away from the female. After a few minutes, he approached again to continue mating process using his left palpal organ. At last, the male moved away, and sometimes he attacked a prey or more, before being attacked by the female.

Oviposition

The female deposits eggs inside spherical transparent egg sacs among silken threads in hidden places such as neglected parts of plants and litter. Pre-oviposition period, before the beginning of laying eggs, lasted 13-14 days when feeding was on *T. urticae* and 10-11 days when prey was *B. brassicae*. The female constructed 2-5 egg sacs during her oviposition period which lasted from 9 to 27 days when feeding was on *T. urticae* and constructed 4-5 egg sacs during 19-25 days when prey was *B. brassicae*. The number of eggs/egg sac was 13-37 in the first case and 17-37 in the second one. The post-oviposition period lasted 8-27 days in the first case and 12-15 days in the second one (Table 1).

Feeding on *B. brassicae* slightly increased the number of eggs/egg sac and the number of egg sacs/female than when the prey was *T. urticae*. This means that *B. brassicae* as prey increased the fecundity of *T. melanostictum* female. This is something similar to what mentioned by Hussein, *et al.* (2003) that feeding *Anelosimus aulicus* on a mixed diet of the black aphid *Aphis craccivora* Koch, 1854 and the mite *T. urticae* increased the fecundity of the female spider than feeding only on aphids, although they found that the mite alone was not suitable for rearing *A. aulicus*.

Table 1: Fecundity of *Theridion melanostictum* female, feeding on *Tetranychus urticae* or *Brevicoryne brassicae*.

Developmental period of female (days)	<i>Tetranychus urticae</i>			<i>Brevicoryne brassicae</i>		
	Range	Mean	S.D.	Range	Mean	S.D.
Pre-oviposition	13-14	13.8	0.1	10-11	9.5	0.2
Oviposition	9-27	14.3	2	19-25	21.3	1.1
Post-oviposition	8-27	16	2	12-15	13.8	0.3
Number of eggs / egg sac	13-37	23.2	2.9	17-37	28.7	2.6
Number of egg sacs / female	2-5	2.8	0.4	4-5	4.5	0.2

Incubation period

The transparent egg sac of *T. melanostictum* becomes dark yellow before hatching. The incubation period was 13-14 days at 28±1°C and 60-70% R.H. (Table 2) regardless of the kind of the prey the mother fed on.

Table 2: Duration of different stages of *Theridion melanostictum*, feeding on different stages of *Tetranychus urticae* or *Brevicoryne brassicae*.

Developmental Stage	<i>Tetranychus urticae</i>						<i>Brevicoryne brassicae</i>					
	Male			Female			Male			Female		
	Range	Mean	S.D.	Range	Mean	S.D.	Range	Mean	S.D.	Range	Mean	S.D.
Incubation period	13-14	13.4	0.0	13-14	13.8	0.0	13-14	13.4	0.0	13-14	13.8	0.0
1 st spiderling	12-13	12.5	0.2	12-13	12.5	0.1	7-8	7.6	0.2	8-9	8.4	0.2
2 nd spiderling	12-14	13.3	0.3	11-12	11.5	0.2	6-7	6.6	0.2	7-10	8.4	0.2
3 rd spiderling	11-12	11.5	0.2	9-11	9.6	0.2	5-6	5.8	0.2	6-7	6.7	0.1
4 th spiderling	7-8	7.2	0.2	8-9	8.3	0.1	10-11	10.2	0.2	9-11	10.7	0.2
5 th spiderling	--	--	--	7-9	7.3	0.2	--	--	--	9-11	10.7	0.2
Total spiderling instars	42-47	44.5	0.2	47-54	49.2	0.2	28-32	30.2	0.2	39-48	45.9	0.2
Life cycle	55-61	57.9	0.2	60-76	63	0.1	41-46	43.6	0.4	52-62	59.7	0.2
Adult Longevity	25-44	39.6	1.9	34-51	43.2	1.5	42-47	44.8	0.9	52-65	59.8	0.3
Life span	80-105	97.5	0.5	94-127	106.2	1.4	83-93	88.4	0.9	104-127	119.5	0.4

Spiderlings development

The female of *T. melanostictum* passed through five spiderling stages, while male only passed through four stages before reaching the adult stage regardless of the

kind of the prey (Table 2). Feeding on *T. urticae*, the 1st and 2nd spiderling instars were longer than other instars while the last instar was the shortest one. On the contrary, the last instar was the longest one and the 3rd instar was the shortest instar in case of feeding on *B. brassicae* (Table 2).

The mean of life cycle of *T. melanostictum* was longer when spider fed on *T. urticae* (57.9 and 63 days for male and female respectively) than when feeding was on *B. brassicae* (43.6 and 59.7 days for male and female).

Sex ratio

During one generation of *T. melanostictum*, the male : female ratio was 1 : 1.4 when feeding was on *T. urticae* and the ratio was 1 : 1.9 after feeding on *B. brassicae*.

Adult longevity

Adult longevity also differed according to sex and food type. Adult male longevity was 39.6 and 44.8 days while that of female lasted 43.2 and 59.8 days when fed on *T. urticae* and *B. brassicae* respectively.

Although the life cycle of *T. melanostictum* was shorter when fed on *B. brassicae* than when fed on *T. urticae*, the adult longevity was longer when feeding was on *B. brassicae* (Table 2).

Food consumption

Feeding on *T. urticae*, the mean daily rate of 1st spiderling was 6.3 and 6.2 individuals per male and female respectively. The mean daily rate of male 2nd-4th spiderlings was 11.4-12.8 individuals while it was 12.6-13.9 individuals for the female 2nd-5th spiderlings. The mean total number of consumed individuals was 453.6 and 567.4 for the total spiderlings of male and female respectively. The mean total number of consumed *T. urticae* individuals during longevity of adult male was 286.2, while that of female was 560.7 individuals (Table 3).

Table 3: Food consumption of *Theridion melanostictum* feeding on different stages of *Tetranychus urticae* (Number of consumed individuals).

Developmental stage	Male						Female					
	Daily rate			Total			Daily rate			Total		
	Range	Mean	S.D.	Range	Mean	S.D.	Range	Mean	S.D.	Range	Mean	S.D.
1 st spiderling	2-10	6.3	4.4	71-80	75.7	1.39	2-11	6.2	7.6	68-80	73.8	2.8
2 nd spiderling	9-15	12.8	4.9	120-161	157	5.5	10-17	12.6	17.3	113-171	157.3	3.7
3 rd spiderling	11-16	11.4	10.9	65-90	80	3.5	9-17	12.9	10.6	82-136	116.8	4.3
4 th spiderling	11-17	12.8	7.9	127-152	140.9	3.1	12-17	13.6	24.9	101-129	122.4	11.4
5 th spiderling	--	--	--	--	--	--	12-19	13.9	11.1	82-105	97.1	2.2
Total spiderling instars	33-58	43.3	2.7	383-483	453.6	3.6	45-81	59.2	12.3	446-621	567.4	4.6
Adult Longevity	29-36	32.4	0.7	216-322	286.2	5.2	37-53	44.4	3.7	439-649	560.7	12.2

When feeding was on *B. brassicae*, the mean daily rate of 1st spiderling was 2.2 and 2.4 individuals per male and female respectively. This rate gradually increased with age. It was 4.2-6.1 individuals for the male 2nd-4th spiderlings and 4.5-7.5 individuals

for the female 2nd-5th spiderlings. The mean total number of consumed individuals was 141.1 and 228.7 individuals for the total spiderlings of male and female respectively. The mean total number of consumed *B. brassicae* individuals during longevity of adult male was 115.2, while that of female was 263.6 individuals (Table 4).

Table 4: Food consumption of *Theridion melanostictum* feeding on nymphs of *Brevicoryne brassicae* (Number of consumed individuals).

Developmental stage	Male						Female					
	Daily rate			Total			Daily rate			Total		
	Range	Mean	S.D.	Range	Mean	S.D.	Range	Mean	S.D.	Range	Mean	S.D.
1 st spiderling	1-4	2.2	1.7	15-21	16	1.1	1-4	2.4	1.7	14-24	17.2	0.4
2 nd spiderling	4-7	4.2	7.4	18-29	24.9	2.1	3-7	4.5	5.4	22-41	31.5	3.4
3 rd spiderling	3-8	5.4	4.5	24-40	32.6	3.2	4-9	5.9	5.4	28-47	35.9	1.7
4 th spiderling	4-9	6.1	2.1	62-78	67.6	2.7	5-9	6.8	11	57-88	68.3	2.7
5 th spiderling	--	--	--	--	--	--	6-12	7.5	6.6	65-93	75.8	2.6
Total spiderling instars	12-28	17.9	0.8	119-168	141.1	7.1	19-41	27.1	2.1	186-293	228.7	3.1
Adult Longevity	19-32	28.3	2.1	114-123	115.2	1.8	35-47	41.4	0.9	243-308	263.6	7.3

It is evident that the adult female *T. melanostictum* consumed prey much more than the male. This maybe due to his smaller size and shorter longevity than female.

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Spider studies in Egypt A review

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Abstract

The first scientific record of spiders in Egypt was that of Linnaeus (1758). It was succeeded by several records and taxonomic studies by Forskål, Savigny & Audouin (in *Description de l'Égypte*), Koch, Pickard-Cambridge, Simon, and Denis. Thereafter, in 1950, the native araneologist Hassan was the first Egyptian in this field. At the end of the 1990's, a new era began with ecological studies on spiders by several scientists to extend the scope of spider studies in Egypt beyond the boundaries of taxonomy. This review includes 6 parts: I. The beginnings, II. The first Egyptian and his successor, III. Universities theses, IV. Ecological and applied research, V. Artificial works, and VI. Bibliography.

Keywords: Spiders, Review, Egypt.

I. The Beginnings

Although spiders were well known to people in Egypt since ancient times, we cannot find any scientific publication on Egyptian spiders before 1758. *Aranea flavissima* was the first spider species to be scientifically recorded from Egypt by Carolus Linnaeus, 1707-1778. His very brief description (1758), in the 10th edition of his "Systema Naturae" p.622 [22. *Aranea abdomine oblongo flavissimo laevi. M. L. U. Habitat in Aegypto. Hasselqvist. Thorax fulvus. Pedes glabri.*], is not enough to identify such a species as Simon (1910) stated.

The second scientific record of spiders from Egypt was that of the Swedish Petrus Forskål, 1732-1763, who visited Egypt in 1761-1762 with a Danish expedition to Yemen and described four spider species from the region of Cairo : *Aranea citricola*, *A. insidiatrix*, *A. rivulata* and *A. trifasciata*. His descriptions were more detailed and, at

least, enough for identification. His work was published after his death, during the expedition, by Carsten Niebuhr in Copenhagen (1775).

The third and most important study of Egyptian arachnids was the work of Marie-Jules-Cesar-Lelorgne de Savigny, 1777-1851, who accompanied the French military expedition of Napoleon in Egypt (1799-1801). His work was completed by his student Victor Audouin, 1797-1841, because of his professor's blindness. That work appeared in 1825 under the title "*Explication sommaire des planches d'Arachnides de l'Égypte et de la Syrie, publiée par Jules-César Savigny, membre de l'Institut; offrant un exposé des caractères naturels des genres, avec la distinction des espèces.*" *Histoire naturelle, t. I, no.4.*, a volume of the great book entitled: "*Description de l'Égypte ou Recueil des observations et des recherches qui ont été faites en Égypte pendant l'Expédition de l'armée française.*". This work was reprinted in 1827 in a smaller format. It was included in volume 22 of that second edition, which was always referred to by most authors and researchers.

The work of Savigny and Audouin included nine plates (112 figures) of drawings of arachnids.

- Plates 1-7: spiders (81 species of 30 genera classified in 20 groups) = 71 species + 6 synonyms + 5 nomina dubia (in the most recent classification).

- Plate 8 : figs. 1-3 scorpions : 3 species of *Scorpio* = 3 spp.; figs. 4-6 pseudoscorpions : 3 *Chelifer* spp. = 2 spp. + 1 n.d.; figs. 7-10 solpugids : 4 *Solpuga* spp. = 3 spp. + 1 syn.

- Plate 9 : figs. 1-3 opilionids : 3 *Phalangium* spp. = 1 sp. + 2 n.d.; figs. 4-13 acarids : 10 spp. of 3 genera = 6(+2) spp. + 1 syn. + 1 n.d.

Every figure group of a species includes a habitus drawing and minor details drawings.

The text and the nine plates were edited and reprinted by El-Hennawy in *Serket*, 3(2-4) (Audouin, 1993). The exact date of publication and the authority of the scientific names dealt with in the work of Audouin (1825) were discussed in detail by El-Hennawy (2000a).

The fourth step was that of the German Ludwig Carl Koch, 1825-1908, who recorded 15 species of spiders from Cairo, Egypt in his "*Aegyptische und Abyssinische Arachniden*" (1875), 7 of them as new species.

The fifth step was the "*Catalogue of a collection of spiders made in Egypt, with descriptions of new species and characters of a new genus*" (1876) of the English Rev. Octavius Pickard-Cambridge, 1828-1917, who previously studied a collection of Arachnida from Sinai (1870), and spiders of Palestine and Syria (1872a) including records from Egypt, and new gnaphosoid species from Egypt and other countries (1874), in addition to a description of a new linyphiid spider from Alexandria (1872b).

The Rev. Pickard-Cambridge visited Egypt in 1864, in his way to Jerusalem (a holy pilgrimage trip). He devoted his time and life to the study of spiders in his country, England, and wished to broaden the geographical scope of his interest by studying the spiders of Palestine (the Holy Land) and Egypt. Cambridge's Catalogue included 164 species from Alexandria to Assuan (63 of them as new species). The total spider species number raised to 226.

The French Eugène Simon, 1848-1924, who is the father of arachnology in the modern times, recorded and described new species of spiders, scorpions, sun-spiders and pseudoscorpions from Egypt in several papers during the period 1880-1910. Two of his works (1908 & 1910) about Eresidae spiders and scorpions were published in the bulletin of the entomological society of Egypt.

Jacques Denis, 1902-1972, continued the French activity by scattered records in different papers (1935-1965), through his studies of North African spiders, in addition to his remarkable work on spiders of Siwa Oasis (1947b) which was also published by

the entomological society of Egypt. In this work, he recorded 89 species, 25 of them as new species.

II. The first Egyptian and his Successor

The first Egyptian araneologist, Abbas Ibrahim Hassan was a professor of zoology in Cairo University when he described *Chaetopelma shabati* Hassan, 1950 as a new species of Theraphosidae from Cairo. He deposited the type material of this species in the British Museum of Natural History (London). He published another paper about the Oecobiidae of Egypt (1953). Thereafter, he went to Syria to continue his pedagogical activity and to stop publishing works about spiders. He prepared unpublished list of 318 Egyptian spider species, a long work on Egyptian jumping spiders (Salticidae) and a few short papers. One of his works “Feeding and feeding apparatus of *Chaetopelma shabati*”, prepared for publication in 1953, was revised and published in *Serket* in 1988.

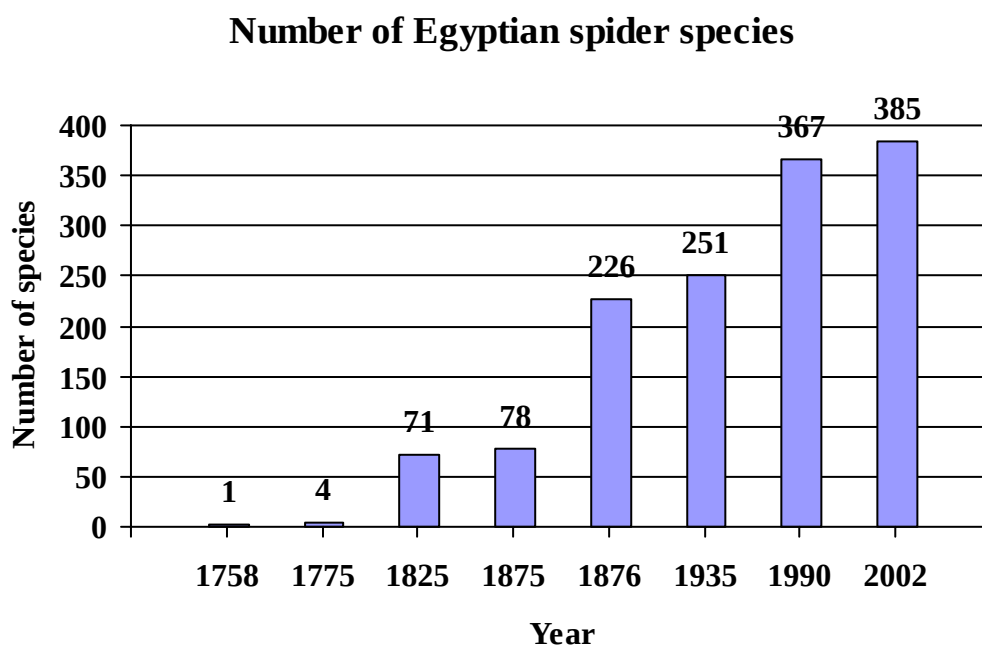


Fig. 1. Number of Egyptian spider species (1758-2002).

In 1982, Hisham K. El-Hennawy presented his first paper on a pompilid wasp (Hymenoptera: Pompilidae) and an eresid spider to the first Egypt's National Conference of Entomology, Cairo 1982 (published 1985). A year later, he presented his second paper to the 9th International Congress of Arachnology, Panama 1983 (published 1986). In August 1987, he began publishing **SERKET**, the Arachnological bulletin of the Middle East and North Africa. Thirty two issues of eight volumes were published till now dealing with arachnids of different orders, Araneida, Opilionida, Pseudoscorpionida, Scorpionida, Solpugida, and pompilid enemies of spiders. He was the author of most of the published material. Other authors of different countries enriched *Serket* with their works. His bulletin did not prevent him from publishing through international arachnological congresses (Panama, 1983; Geneva, 1995; Edinburgh, 1997 & South Africa, 2001).

The study of Egyptian spiders is the main topic in his works (1985-2002). In addition to his new locality records and other works, he published a list of Egyptian spider genera (1987b), an annotated checklist of Egyptian spider species (1990a), the distribution of spider genera in Egypt (1992) and recently a list of Egyptian spiders, revised in 2002 (2002c). [The increase in the number of discovered species of spiders from Egypt is plotted in Fig. (1).] One of his topics is the study of spiders in protected areas of Egypt, e.g. Wadi El-Raiyan (1991a) and coastal protected areas on Aqaba gulf (2003). He also published a book (in Arabic) on the Egyptian Arachnids (El-Hennawy, 2002f). His work on the first record of *Amblypygi* from Egypt (El-Hennawy, 2002e) tells us that there are many species and genera of spiders and other arachnids to be discovered in Egypt. In addition to identifying thousands of specimens studied in universities theses and other works, he also encouraged the study of biological aspects of different spider species (see part IV of this work) and participated in some of them (El-Hennawy & Mohafez, 2003 and Sallam & El-Hennawy, 2003).

III. Universities Theses

There were two unsuccessful trials to prepare M.Sc. theses in Cairo University (Faculty of Science) in the 1950's and 1960's. After a long period of quiescence, a "diapause", the universities began to activate the study of spiders again.

[The researchers in the field of agriculture in Egypt used to say "true spiders" for spiders to distinguish between them and mites, which are widely studied in their field of work. Hence, this erroneous term is found in the titles of their theses and papers.]

1. In 1988, Ashraf Rahil presented his M.Sc. thesis: "Ecological and biological studies on the spiders at Fayoum" to Faculty of Agriculture, Cairo University (El-Fayoum). He collected spiders of 11 families (20 genera and 22 species) from El-Fayoum governorate associated with two field crops (cotton and cucumber) and studied biology of two spider species of families Clubionidae and Theridiidae.

2. In 1988 also, Mostafa El-Mehalawy presented his M.Sc. thesis: "Some studies on spider families of Al-Gharbia governorate" to Faculty of Science, Tanta University. He collected spiders of six genera from El-Gharbia governorate. He erroneously recorded *Oecobius teliger* Cambridge, 1872 (Family Oecobiidae) as new species from Egypt.

Both Rahil and El-Mehalawy did not continue their studies on spiders for Ph.D. degree.

3. In 1996, Gihan Sallam presented her M.Sc. thesis: "Studies on true spiders in Giza governorate" to Faculty of Agriculture, Cairo University. Her study included a survey of spiders in Giza governorate (August 1992 - December 1994) among fruit trees (*i.e.* apple, pear, grape, peach, olive, citrus, guava, and mango), field crops (*i.e.* cotton, maize and soybean) and ornamental plants (*i.e.* dadhi, mulberry, diafla, and daisy). She recorded 25 species of 18 families (Shereef *et.al.*, 1996). The thomisid *Xysticus tristrami* (Cambridge, 1872) was recorded in Egypt for the first time below apple trees. Salticidae and Clubionidae were the most abundant families. Biological aspects of *Cheiracanthium* sp. (Miturgidae) and *Plexippus paykulli* (Audouin, 1825) (Salticidae) were studied at 25°C and 60-70% R.H., feeding on *Ceratitis capitata* adults and *Spodoptera littoralis* larvae (1-4 stages) respectively (Rakha *et.al.*, 1999; Shereef *et.al.*, 1999).

4. In 2002, Sallam presented her Ph.D. thesis: "Studies on true spiders in Egypt" to Faculty of Agriculture, Cairo University. Her work can be summarized in: A survey of spiders was carried out in four governorates of both Lower Egypt (El-Qalyubia and El-Sharqia) and Middle Egypt (El-Fayoum and Beni-Suef) during the period from

August 1996 to December 1998. Most of the collected species, of 17 families (23 genera and 25 species), were recorded from the four governorates for the first time. The relationship between spiders abundance, temperature and relative humidity in the four governorates was studied in association with the cultivated plants, i.e. olive, orange, grape and apple. The highest population of spiders was recorded during summer extended to autumn (Sallam, 2002b). The biological aspects of *Thomisus spinifer* Cambridge, 1872 were studied under laboratory condition at 25°C and 60-70% R.H. The spiderling instars 1-3 were reared on the red spider mite *Tetranychus urticae*, while other spiderling instars and adults were reared on the adults of the fruit fly *Ceratitis capitata*. The fungicides were slightly harmful (25-50 %) to spiders. The organophosphorus compound *Malathion* was obviously harmful (>75%) to spiders. The mineral oil *KZ* was moderately harmful (50-75%) on the population density of spiders. The acaricides *Vertimec*, *Ortus* and *Cascade* were harmful (>75%) to spiders, while *Challenger* was moderately effective (50-75%) against spiders.

5. In 2000, Mohamed El-Erksousy presented his Ph.D. thesis: “Studies on some true spiders in Egypt” to Faculty of Agriculture, Al-Azhar University (Cairo). [Note. His M.Sc. was on mites.] He carried out a two years survey of spiders (1996-1998) in 12 governorates in Upper Egypt (El-Giza, El-Fayoum and Beni-Suef), Lower Egypt (El-Qalyoubia, El-Gharbiya, El-Menofya, El-Beheira, Sharkia, Kafr El-Sheikh, El-Dakahlia and Suez Canal) and Cairo to record 37 species of 18 families on different crops. Spider populations in cotton and clover crops were studied (1997-1998) in El-Beheira and El-Fayoum governorates. The seasonal fluctuations of spiders were studied in El-Beheira and Beni-Suef governorates to record the increase of spiders by increasing hygrothermic conditions. The highest population was in June-August while the lowest population was in April-May. The effect of pesticide application, for cotton pests control, on spider population was studied to find that the percentage reduction in spider final population varied greatly according to their families. The life cycle of *Crustulina conspicua* (Theridiidae) was studied under laboratory conditions (26°C, 60-70% R.H.), feeding on the spider mite *Tetranychus urticae*.

6. In 2000 too, Mohamed Mohafez presented his M.Sc. thesis: “Studies on true spiders in Sohag governorate” to Faculty of Agriculture, Al-Azhar University (Cairo). His work included a survey of spiders on 10 different crops in seven districts of Sohag governorate during two successive years. Collected spiders were classified into 19 families (Metwally *et.al.*, 2002a). He studied the population density and seasonal fluctuation of spider species in relation with different crops during two years (Metwally *et.al.*, 2002b). He also studied the biological aspects of *Hersilia caudata* Savigny, 1825 (Hersiliidae) under laboratory conditions, 26-28°C and 60-70% R.H. Both mating and feeding behaviours were described (Metwally *et.al.*, 2001).

7. In 2003, Naglaa Ahmed presented her M.Sc. thesis: “Studies on some arthropods inhabiting cucurbits and beans.” to Faculty of Agriculture, Cairo University. She surveyed spiders and other arthropods inhabiting fields of four legume and five cucurbit crops. Their seasonal abundance was also studied in El-Qanater agricultural research station. Sixteen families of spiders were recorded (33 genera and 36 species) during survey. She studied the life cycle of *Anelosimus aulicus* (C.L. Koch, 1838), family Theridiidae, under laboratory conditions (Hussein *et.al.*, 2003). Different instars were reared on *Tetranychus urticae*, *Aphis craccivora* or on a mixture of both of them. Prey consumption was calculated for different stages. Effect of different diets on fecundity of the spider was studied. Mating behaviour was also described.

8. In the same year, El-Sayed Hamada presented his M.Sc. thesis: “Studies on true spiders associated with some vegetable crops.” to Faculty of Agriculture, Menoufia

University. He collected spiders of 14 families from ten vegetable crops at Gharbia governorate during two successive years by two methods of collecting (pitfall traps and picking up with the hands). The most dominant family was Lycosidae followed by Linyphiidae and Philodromidae (Abo-Taka *et.al.*, 2003a). He also reared the linyphiid spider *Erigone dentipalpis* (Wider, 1834) and the theridiid spider *Theridion melanostictum* O.P.-Cambridge, 1876 under laboratory conditions, feeding on the two-spotted spider mite *Tetranychus urticae* and the green aphid *Brevicoryne brassicae*. The rate of prey consumption was recorded (Abo-Taka *et.al.*, 2003b and 2004). The effects of three different pesticides were studied in the field and laboratory.

9. And also in 2003, Mamdouh Ibrahim presented his M.Sc. thesis: "Studies on some true spiders associated with certain fruit trees in Ismailia governorate" to Faculty of Agriculture, Al-Azhar University (Cairo). His work included a survey of spiders of 22 families on different fruit trees in six regions in Ismailia governorate during two successive years. In the same time, he studied the population density and frequency occurrence of spider species in fields of Mango trees at Serabium locality. He also studied the biology of two spider species, the liocranid *Mesiotelus tenuissimus* (L.Koch, 1866) and the philodromid *Philodromus glaucinus* Simon, 1870, under laboratory conditions.

IV. Ecological and Applied Research

In the 1960's, spiders were increasingly mentioned in numerous studies by Ahmad H. El-Kifl as important creatures among the soil fauna (e.g. El-Kifl, 1969). He was a pioneer in the agricultural studies of soil fauna in Egypt. A few researchers continued in the same field to mention spiders mostly as a group and sometimes identified to families (e.g. Negm *et.al.*, 1976).

Near the end of the 1990's, a good cooperation between ecology and taxonomy, or say between applied and pure trends of science, yielded the first published paper in this field in Egypt. Prof. Dr. Samir Ghabbour encouraged this new trend of research and had his important role in the first work which was entitled: "Spider populations associated with different crops in Menoufiya governorate, Nile Delta, Egypt." (Ghabbour *et.al.*, 1999). In that work, a survey on spiders in 18 different agricultural crops in the southern Nile Delta was carried out in 1996, using pitfall traps. In summer crops, density of spider individuals was 2.28 ± 1.29 per trap, compared with 2.38 ± 1.69 in winter crops. Highest densities in summer crops were in tomato, eggplant, and cucurbit cultivations, while in winter occurred in caraway, cabbage and onion cultivations. Sweet potatoes had the lowest density. Densities in spring varied from 0.4/trap in taro to 6.55/trap in caraway cultivations. It appeared that plants with a dense foliage covering the ground (sweet potatoes and taro), constrain the movement of roaming spiders. Ten spider families were recorded in winter crops compared to twelve in summer. Lycosidae was dominant in both seasons, constituting about 80%, followed by Linyphiidae, Philodromidae, Gnaphosidae and Tetragnathidae. Males were trapped in higher numbers than females. Juveniles constituted 23-26% of the trapped samples, while subadults were more abundant in winter. Female lycosids carrying egg sacs had two peaks; one in spring and one in summer, but none was observed in winter. Correspondence analysis had shown that *Zelotes* complex was more associated with cabbage, and a group of *Lycorma** *ferox*, *Thanatus albinus*, Dictynidae, and Clubionidae, with peas, while *Erigone dentipalpis*, Philodromidae, Tetragnathidae and *Dysdera* spp. were more associated with caraway. On summer, *Prinerigone vagans*, *E. dentipalpis*, Linyphiidae, Philodromidae and Salticidae were more associated with potato and Soya

bean crops, while *L. ferox*, *T. albin*, *Zelotes* complex and *Trachyzelotes* sp. were more associated with cotton. [**Lycorma* = *Hogna* in recent taxonomic works]

One of the three authors of that, mentioned above, work published another related work on: “Seasonal abundance and daily activity patterns of spider fauna in some vegetable crops in Menoufiya governorate, Egypt.” (Hussein, 1999). In his work, diversity, seasonal abundance and diurnal-nocturnal activity of spider population under 8 vegetable crops were studied in an agro-ecosystem in Menoufiya governorate, Southern part of Nile Delta, Egypt. A Total of 516 individuals were caught using pitfall traps during the study period. Six species belonging to six families were identified. Lycosidae was the dominant family, 86.42% of the populations, followed by Philodromidae, Linyphiidae and Gnaphosidae, while Theridiidae and Salticidae were the rare families in occurrence. *Thanatus albin* (Philodromidae) was the dominant species (5.43%). The peak of activity (19 ind/hr) and higher values of diversity (9 species) were recorded in summer, while the lowest were in winter (0.08 ind/hr and 3 species respectively). *Lycorma ferox* (Lycosidae) is active only in night-time as well as *Setaphis subtilis* (Gnaphosidae) which showed major activity (75%) during night against 25% on daytime. *Erigone dentipalpis* (Linyphiidae) and *T. albin* are completely active in daytime, Lycosidae (except *L. ferox*), Linyphiidae (except *E. dentipalpis*) showed major activity on daytime (91.10, 84.21%, respectively). The 3 different daytime parts (the early, mid day and the later third) showed similar values of activity, diversity, as well as the nocturnal activity in summer, while winter recorded the lowest values and notable fluctuations between night and daytime. The high abundance of spiders in August seems to be a result of a combination of 3 factors, dense vegetation cover, high temperature and enough relative humidity.

The third work, which was published before the two mentioned above, was a study on the “Biodiversity of spiders in the western desert of Egypt in relation to agriculture and land reclamation” (Hussein *et.al.*, 1998). Spider biodiversity was studied in 5 locations in the Western Desert of Egypt : Siwa Oasis, Wadi Natron, Wadi El-Raiyan, Tahrir Province and the New Valley. Siwa Oasis was considered as a base for comparison for its richness and high variety abundance of spider fauna. Each of the studied areas was characterized by certain spider species. The agro-ecosystems of Nile Delta are characterized by 10 families of spiders different from those of the studied locations. *Latrodectus tredecimguttatus* (Theridiidae) of the genus of the black widow spider, was first recorded from the Western Desert of Egypt. Presence and densities of *Thanatus albin* (Philodromidae) and *Lycorma* sp. (Lycosidae) could be considered as indicators for changes in the desert ecosystem due to human activities.

Hussein (2001a) published his work on “Soil pricking” as a new, easy, simple, and inexpensive agricultural method, without chemicals application, to intensify spider efficiency as biological control agent. It aims saving enormous efforts for mass rearing of spiders as biological control agents against various pests. Pricking the previously irrigated soil to 7-8 cm depth using a stick (of 1/2 inch diameter) to create holes with 50-60 cm distance in between. These holes encourage the wandering spiders to reside in the pricked hole, spinning nets on the external edge of holes, catching preys in the area and on surrounding plants. Applying this method led to intensification and increasing the spider population to 76% and 107% in cucurbits and lettuce, respectively during 1998, and 86% and 85% in cucurbits and peanut fields, respectively in 1999 season. Intensifying spiders population led to reduction of different pests e.g. aphids, jassids, phytophagous mites, white fly, lepidopteran larvae and *Nizara viridula* with

considerable reduction rate 39.64%, 49.45%, 16.67%, 50.48%, 33.33% and 21.14% respectively. Moreover no harmful effects for the natural enemies of insect pests were observed e.g. *Coccinella* sp.

In the same year, Hussein (2001b) published his study on the effects of mulching and holing on spider behaviour. He found that spiders behaviour was considerably affected in holing area and that the established webs increased to 19%, 52%, 76% and 85% after 2, 4, 6 and 8 weeks respectively.

Hussein *et.al.* (2002) studied the effect of the mineral oil *CAPL 1* on spiders. An experiment of completely randomized design was carried out along two seasons, 1999 and 2000, to clarify effect of the mineral oil *CAPL 1* in comparison with *vertimec* pesticide on the population density of soil fauna. Results showed that 6 families of spiders were occurred in the tomato plantation in Berma village, Gharbia governorate. The dominant family of spiders was Lycosidae (74.1% of the total spider populations) and the rarest family was Theridiidae. Density of the spiders increased in the mineral oil plots with 25% and 40% during 1999 and 2000 respectively. A preliminary test was carried out in the laboratory to determine whether the oil is attractive or not to the spiders. Results of this test were positive.

Continuing the study of biological aspects of Egyptian spider species, El-Hennawy & Mohafez (2003) studied the life history of the eresid *Stegodyphus dufouri* (Audouin, 1825) under laboratory conditions, feeding on different kinds of prey for different instars of spiderlings. Some spiderlings were reared together (communal rearing). The second generation was also kept together for more observation. Behavioural observations were reported on this spider both in nature and laboratory. These observations lead to a conclusion that the behaviour of this species is a step on the way to social life.

Also, Sallam & El-Hennawy (2003) studied some biological aspects of the titanoecid *Nurscia albomaculata* (Lucas, 1846) which was found in greenhouses in Dokki, Giza. Its life cycle was studied in laboratory. Different instars were reared on different stages of larvae of cotton leaf worm. Food consumption was also studied, in addition to some biological and ethological aspects.

V. Artificial Works

Depending on the general ignorance of spiders classification and biology, some researchers found the climate appropriate to publish “artificial” works on spiders. I could not add those **false** works to the bibliography at the end of this work, but I have to discuss them here briefly.

1) Abdel-Rahman, S.I., Ibrahim, A.A. & El-Erksousy, M.H. (2001) Laboratory studies on the web-weaver spider *Dictyna latens* (Fabricius) (Araneida : Dictynidae), as a predator on two prey species: *Spodoptera littoralis* (Boisd.) and *Tetranychus urticae* Koch. *Proc.1st integrated pest management conf.*: 179-182.

The authors did not tell us how they could identify their species *Dictyna latens*. Indeed, this species is not recorded till now from Egypt. Hence, the published data are dubious

2) El-Erksousy, M.H., Shoeib, A.A. & Dahi, H.F. (2002) Studies on biological control using the spider *Anelosimus oulicus* (Theridiidae). *Proc.2nd Int.conf.plant protection research inst.*: 1-2.

The authors reared their species, of 5 spiderling instars, feeding on the cotton leaf worm, *Spodoptera littoralis* (Boisd.). They recorded that their spider fed on about 10 larvae per day during the 5th instar, and that feeding needs 2-3 minutes per prey !!

The name of the spider is misspelled everywhere in the paper as *A. oulicus* instead of *A. aulicus* !!.

3) Fawzy, M.M.H. & El Erksousy, M.H.M. (2002) Description of new comb-footed spider *Theridion egyptium* sp.n. in Egypt (Araneae: Theridiidae). *Proc.1st conf.central agric.pesticide lab.*: 831-835.

The authors described the male and female of a new species without comparing their specimens with specimens, descriptions or drawings of other species of the same genus, and without consulting any specialist in Egypt or any other country. They prepared slides of their specimens as in case of mites. This yielded very ambiguous drawings in addition to their poor quality (Fig. 2). The work is merely a grouping of mistakes. It is enough to mention here that one of their drawings (Fig. 3) included a cribellum, while any beginner in the field of araneology must know that this organ is neither found in genus *Theridion* nor any other genus of family Theridiidae.

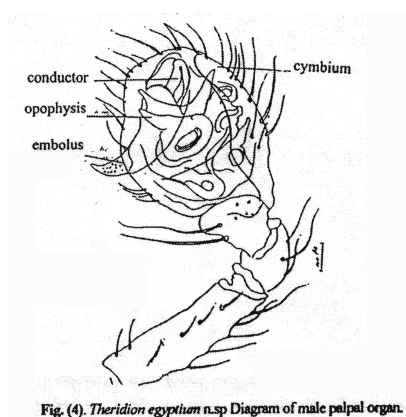


Fig. (4). *Theridion egyptium* n.sp. Diagram of male palpal organ.

Fig. 2. Fourth figure in Fawzy & El Erksousy (2002).

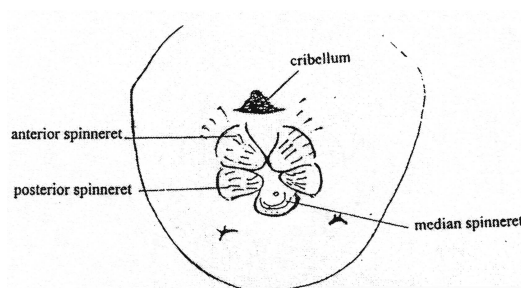


Fig. (3). *Theridion egyptium* n.sp. Anal part of spider showing spinnerets..

Fig. 3. Third figure in the same work.

4) El-Erksousy, M.H., Mousa, G.M. & Gomaa, W.O. (2002) The spider *Theridion egyptium* Fawzy and Elerksousy as a biological control agent on cotton aphid, *Aphis gossypii* Glover. *Proc.2nd Int.conf.plant protection research inst.*: 25-26.

The authors said that their spider had only two spiderling instars after emerging from the egg until reaching maturity, while five instars are the minimum known number in spiders (Foelix, R.F. 1996. *Biology of Spiders*. Second Edition. Oxford University Press & Georg Thieme Verlag, New York, Oxford. 330 pp.: p.222). Also, they mentioned that the life cycle was about 40 days.

5) El-Erksousy, M.H. (2002) Biological studies on the spider *Theridion egyptium* Fawzy And Elerksousy. *Proc.2nd Int.conf.plant protection research inst.*: 40-42.

Feeding on the two-spotted spider mite *Tetranychus urticae*, the life cycle of the spider was about 43 days. But also, there were only two spiderling instars as in the predecessor paper.

Note. Some works were published in obscure periodicals, so they were not available to the author to be included in this review.

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Review of spiders of genus *Eresus* in Egypt (Araneida : Eresidae)

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Abstract

The type material specimens of Egyptian *Eresus* species were examined, redescribed, and photographs and drawings of genitalia were prepared. All Egyptian *Eresus* species were reviewed. *Eresus pharaonis* Walckenaer, 1837 and *Eresus semicanus* Simon, 1908 are redescribed. *Eresus petagnae* Audouin, 1825 is considered *nomen dubium*. *Eresus pulchellus* Lucas, 1864 of Nubia and *Eresus albo-marginatus* Lucas, 1864 of Senegal are considered *nomina nuda*. *Eresus walckenaeri* Brullé, 1832 is considered a doubtful record from Egypt.

Keywords: Eresidae, *Eresus*, Egypt, Taxonomy, Spiders.

Introduction

Genus *Eresus* Walckenaer, 1805 is an old world eresid genus. Its 18 species and 7 subspecies are distributed in Europe, Mediterranean countries, North Africa, West Asia to China, and Senegal ? (Platnick, 2004).

The first record of *Eresus* from Egypt was that of Audouin (1825). He described two species under the names *E. petagnae* and *E. dufourii*. The second of them was later transferred to genus *Stegodyphus* by Simon (1885) and redescribed by Kraus & Kraus (1988). *E. petagnae* was recorded and mentioned several times by Simon (1873 & 1884) and Cambridge (1876).

After seven years, Brullé (1832) recorded *E. theisii* from Turkey, Syria, Egypt in addition to Greece. Walckenaer (1837) described his new species *E. pharaonis* depending on a single specimen from Egypt. In 1864, Lucas described *E. pulchellus* from Nubia. It may be from Egypt or Sudan ?

In 1908, Simon described *E. semicanus* from Alexandria, Mariout and Suez. He reviewed the known species of family Eresidae and described new species from Egypt.

Two years later, Simon (1910) reviewed and redescribed Egyptian eresids among North African spiders of different families.

All descriptions mentioned above lack measurements and drawings of genitalia. The most recent list of Egyptian spiders does not include more than the old records mentioned above (El-Hennawy, 2002). The absence of new material make the review of these species difficult. Therefore, it was necessary to re-examine and redescribe the type material of Egyptian *Eresus* species to partly fill this gap.

Methods

The available type material of the known species were examined. Drawings of the right palp of a male specimen and epigyna and vulvae of female specimens were prepared in addition to their photographs. Measurements of different species were taken in millimetres.

Abbreviations used: ALE = anterior lateral eye; AME = anterior median eye; L = length; MOQ = median ocular quadrangle; PLE = posterior lateral eye; PME = posterior median eye; TL = total length; W = width.

Material from the following collections were examined: MNHN = Muséum National d'Histoire Naturelle, Paris, France; UMO = Oxford University Museum of Natural History, United Kingdom (HECO = Hope Entomological Collection).

Description of Egyptian *Eresus* Species

Genus *Eresus* Walckenaer, 1805

Eresus: Greek ἐρείσω = to attach, to tie up, fasten (Simon, 1864: 299)

Eresus pharaonis Walckenaer, 1837

(Figs. 1A-1E. Table 1)

Eresus pharaonius Walckenaer, 1837: 396.

Erythrophora pharaonis Simon, 1864: 300.

Eresus pharaonis Simon, 1908: 83-84; 1910: 298.

Etymology: *pharaonis*: Greek Φαραώ = Pharaoh, ancient Egyptian king [of the Pharaoh, or Pharaonic]

Material examined: MNHN: *Eresus pharaonis* Walck./ Aegyptus, bottle no.471 (tube no. AR 839) 1♀ (with epigynum separated), 1 j.

Description: Female (MNHN B.471 - t. AR 839): TL 30. Cephalothorax: integument crimson red, covered by creamy white hairs mixed with light brown hairs. Cephalic area gradually inclined into thoracic area. Cephalothorax: L 13 ?. Cephalic part: L 9.52, W 9.52; square. MOQ slightly protruding forwards. Eye measurements: AME 0.20, ALE 0.24, PME 0.37, PLE 0.24, AM-AM 0.34, AL-AL 6.97, PM-PM 0.82, PL-PL 5.86, AM-AL 3.19, AM-PM 0.29. Thoracic part: L 3.48 ?, W 8.84. Chelicerae: crimson red, covered anteriorly by dense orange brown hairs. Sternum L 6.97; Labium L 2.29; Maxilla L 3.65. Sternum, Coxae: yellowish brown. Maxillae, Labium: crimson red. All covered by dense creamy white hairs. Legs and Pedipalps: orange-brown covered by dense creamy white hairs. Tarsi and metatarsi of legs I, II and tarsi and tibiae of pedipalps darker. Spination: spines only on ventral side of tarsi, metatarsi and distally on tibiae; rare on I & II, very few on III & IV. Pedipalp with a claw.

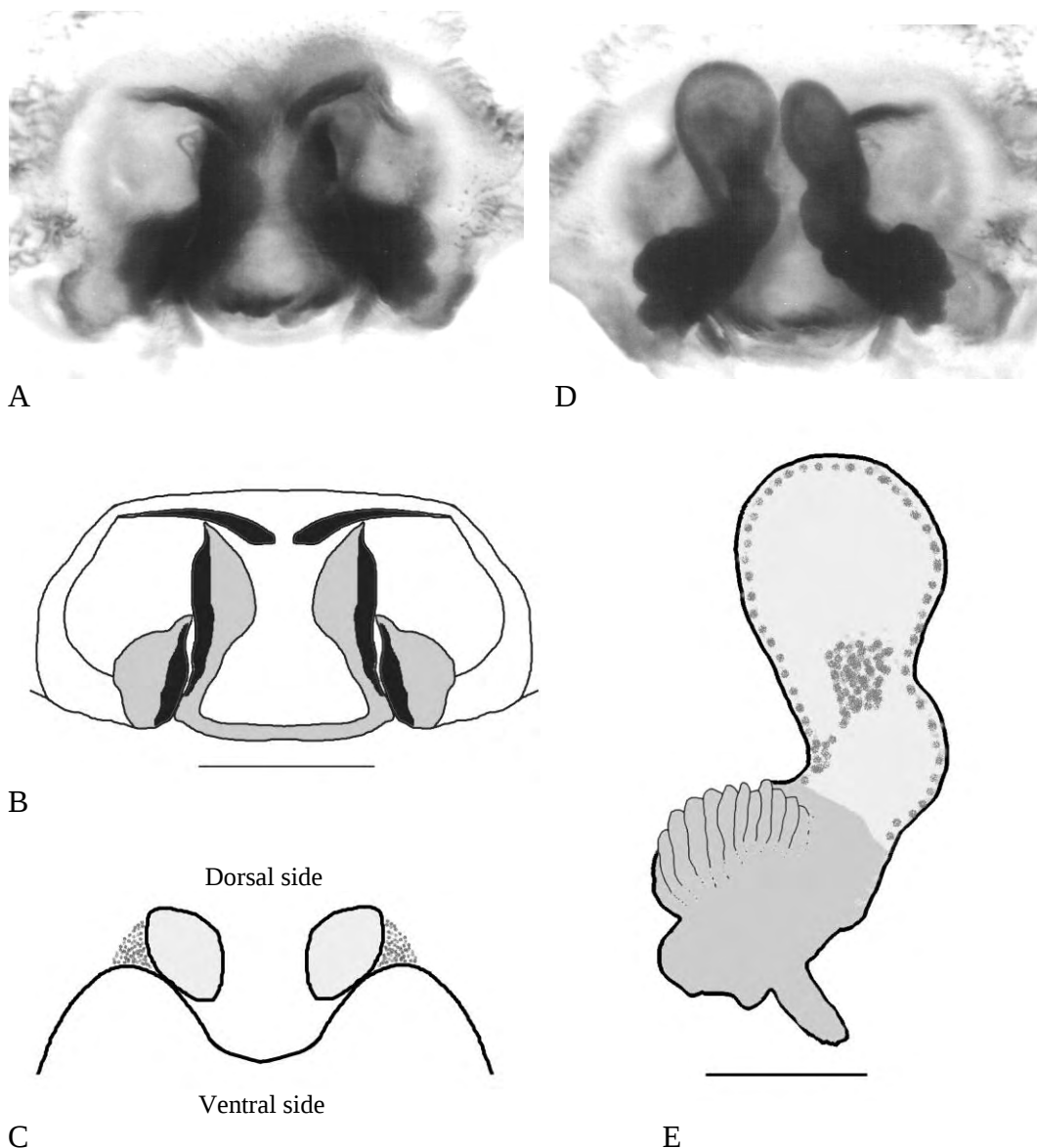


Fig. 1. *Eresus pharaonis* Walckenaer, 1837 ♀ (MNHN).

A, B. Epigynum, ventral view: A. Photograph, B. Schematic drawing.

C. Transverse section of epigynum and vulvae. D. Vulvae photograph, dorsal view.

E. Left vulva, dorsal view. Scale = 0.5 mm (B), 0.25 mm (E).

Table 1. Leg measurements of *Eresus pharaonis* female (MNHN).

Leg	I	II	III	IV
Femur	6.80	5.85	4.76	6.80
Patella	3.67	3.40	3.26	4.08
Tibia	3.40	2.99	2.72	4.08
Metatarsus	3.67	3.40	2.72	4.08
Tarsus	2.31	1.90	1.50	1.63
Total length	19.85	17.54	14.96	20.67

Abdomen: L 19; oval, stout; yellowish white, covered by brown hairs, with 8 sigilla; abdominal pattern absent. Cribellum: bipartite.

Genitalia: (Figs. 1A-1E) Epigynum has two depressions. The anterior chitinous ridge consists of two separate parts. Vulvae are almost confined between the two depressions. Spermathecae are elongated behind the anterior ridge.

The juvenile specimen is lighter in colour. TL 9.11.

Male: unknown.

Distribution: **Egypt:** collected by M. Bové, without definite locality (Walckenaer, 1837). Endemic Species, only recorded from Egypt (Roewer, 1954 & Platnick, 2004).

Note on colouration. The colours of this specimen had changed during more than 160 years in alcohol. Therefore, it is necessary to refer to the first description of Walckenaer (1837), from which the following text is extracted and translated: “Cephalothorax and legs brown black. Posterior slope side of cephalothorax rounded, brown and covered by reddish hairs. Clypeus has long hairs which prolong over chelicerae. The chelicerae are hairy, reddish toward their extremities. Maxillae long, reddish, and very hairy. Sternum flat, red in the middle, provided with furry hairs on the sides. Legs brown black, short, robust, with swollen femora, garnished by furry hairs. Abdomen reddish brown, with some reddish festooned stripes on the posterior part.”

***Eresus semicanus* Simon, 1908**

(Figs. 2A-4B. Tables 2-4)

Eresus petagnae Cambridge, 1876: 554 (misidentification).

Eresus semicanus Simon, 1908: 83; 1910: 294-295, f.5.

Etymology: *semicanus*: Latin *semi-* (*semis*) = half- (one half) + *canus* = white, hoary [half hoary]

Material examined: MNHN: *Eresus semicanus* E.S./ Alexandrie, bottle no.471 (tube no. AR 836) 1♂, 3♀, 16j (with two palps and one epigynum separated). UMO: *Eresus petagnae*, B. 507 t. 9, 2♀, 3j Aleyra (Alexandria).

Description: Male (MNHN B.471 - t. AR 836): TL 9.25. Cephalothorax: integument crimson red, covered by light brown hairs. Cephalic area steeply inclined into thoracic area. Cephalothorax: L 4.76 ?. Cephalic part: L 3.57, W 4.16; rectangular. Eye measurements: AME 0.15, ALE 0.14, PME 0.27, PLE 0.17, AM-AM 0.17, AL-AL 3.29, PM-PM 0.41, PL-PL 2.81, AM-AL 1.43, AM-PM 0.08. Thoracic part: W 3.65. Chelicerae: crimson red, covered by long dense light brown hairs. Sternum L 2.81; Labium L 1.27; Maxilla L 1.85. Maxillae, Labium: crimson red; Sternum, Coxae: orange brown; all covered by light brown hairs. Sternum and first coxae darker. Pedipalps: orange-brown covered by light brown hairs with whitish hairs at joints; patella and tibia without apophyses; cymbium without processes. Palpal organ (Figs. 2A-2B): tip of conductor bifid (divided). Legs: colouration like pedipalps. Spination: spines only on ventral side of tarsi, metatarsi and distally on tibiae; few on I, II & III, numerous on IV. Leg I: metatarsus 0-0-2. Leg II: tarsus 0-2-4; metatarsus 0-1,1-4; tibia 0-0-2. Leg III: tarsus 0-2-4; metatarsus 0-2-4; tibia 0-0-2. Leg IV: tarsus 0-1,1-4; metatarsus 2-2-2-2-4; tibia 0-0-2.

Abdomen: L 5.17; covered by light brown hairs, with 2 wide longitudinal bands of whitish hairs dorsally.

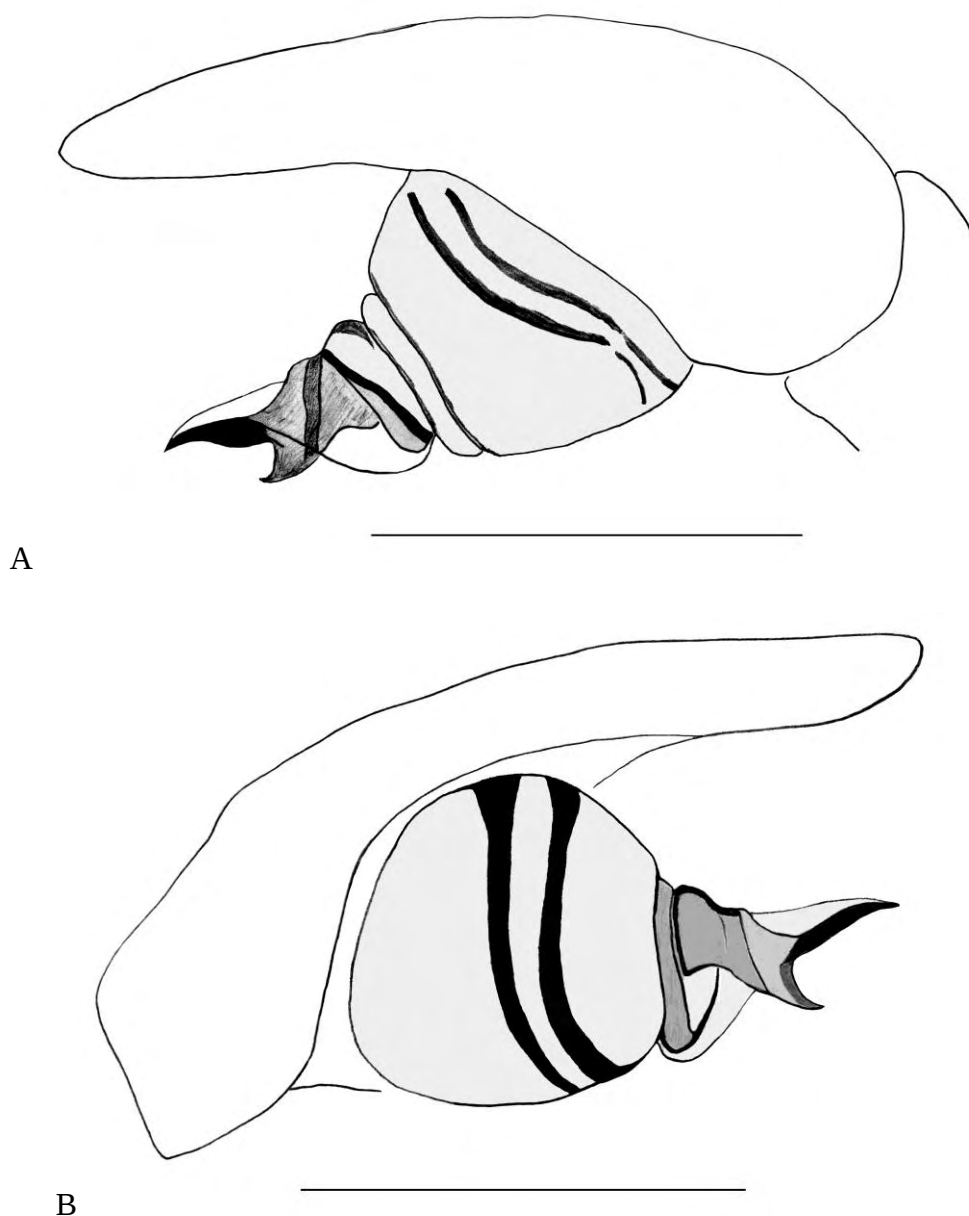


Fig. 2. *Eresus semicanus* Simon, 1908 ♂ (MNHN).
Male palp: A. Prolateral view. B. Retrolateral view. Scale = 0.5 mm.

Table 2. Leg measurements of *Eresus semicanus* male (MNHN).

Leg	I	II	III	IV
Femur	3.55	3.02	2.65	3.55
Patella	1.80	1.75	1.27	1.85
Tibia	2.23	1.75	1.54	2.44
Metatarsus	2.23	1.96	1.59	2.17
Tarsus	1.38	1.17	0.85	1.09
Total length	11.19	9.65	7.90	11.10

Female (MNHN B.471 - t. AR 836): TL 13.19. Cephalothorax: integument crimson red, covered by white hairs mixed with light brown hairs. Cephalic area gradually inclined into thoracic area. Cephalothorax: L 5.03 ?. Cephalic part: L 4.25, W 4.42; almost

square. Eye measurements: AME 0.14, ALE 0.17, PME 0.31, PLE 0.20, AM-AM 0.17, AL-AL 3.44, PM-PM 0.46, PL-PL 3.07, AM-AL 1.48, AM-PM 0.10. Thoracic part: W 4.25. Chelicerae: crimson red, covered by dense white hairs mixed with light brown hairs. Sternum L 3.34; Labium L 1.43; Maxilla L 2.12. Maxillae, Labium: crimson red; Sternum, Coxae: orange brown; all covered by creamy white – light brown hairs. Pedipalps: orange-brown covered by light brown hairs with whitish hairs at joints of legs; tarsi and tibiae darker; tarsus with claw. Legs: colouration like pedipalps; tarsi, metatarsi (specially of legs I, II) darker. Spination: spines only on ventral side of tarsi, metatarsi and distally on tibiae; few on legs I & II, numerous on III & IV.

Table 3. Leg measurements of *Eresus semicanus* female (MNHN).

Leg	I	II	III	IV
Femur	2.91	2.38	2.38	3.44
Patella	1.85	1.75	1.48	2.12
Tibia	1.85	1.59	1.38	2.33
Metatarsus	1.75	1.59	1.32	1.96
Tarsus	1.17	0.95	0.66	1.01
Total length	9.53	8.26	7.22	10.86

Abdomen: L 9.38; creamy white, covered by light brown hairs, with 8 bare sigilla. Cribellum bipartite.

Genitalia (Figs. 3A-4B): Epigynum has a trapezoidal chitinous plate. There is a wide depression between an anterior semi-circular chitinous ridge and the chitinous plate. Vulvae resemble those of *Stegodyphus* (Kraus & Kraus, 1988). The MNHN specimen has vulvae tapering forwards more than in UMO specimen. Spermathecae as depicted in Figs. 3C, 4B.

Measurements of the other two females and a distinguished juvenile (MNHN):

	TL	Abdomen L	Cephalothorax L	Cephalic part L	, W
♀1	12.65	9.66	4.35	3.54	3.81
♀2	10.88	6.80	4.35	3.54	3.81
j	14.28	10.06	5.03	4.62	4.76

Female (UMO B. 507 - t. 9): Different Measurements: TL 17.93 [the smaller female TL 14.61]. Cephalothorax: L 8.30. Cephalic part: L 5.81, W 5.81; square. Eye measurements: AME 0.20, ALE 0.22, PME 0.40, PLE 0.22, AM-AM 0.32, AL-AL 4.40, PM-PM 0.60, PL-PL 4.24, AM-AL 2.00, AM-PM 0.08. Thoracic part: L 2.49, W 5.56. Sternum L 4.20; Labium L 2.40; Maxilla L 2.40. Abdomen: L 13.78.

Table 4. Leg measurements of *Eresus semicanus* female (UMO).

Leg	I	II	III	IV
Femur	4.00	3.48	3.60	4.80
Patella	2.20	2.20	2.20	2.80
Tibia	2.40	2.08	1.80	3.00
Metatarsus	2.08	2.00	1.60	2.60
Tarsus	1.20	1.20	0.92	1.08
Total length	11.88	10.96	10.12	14.28

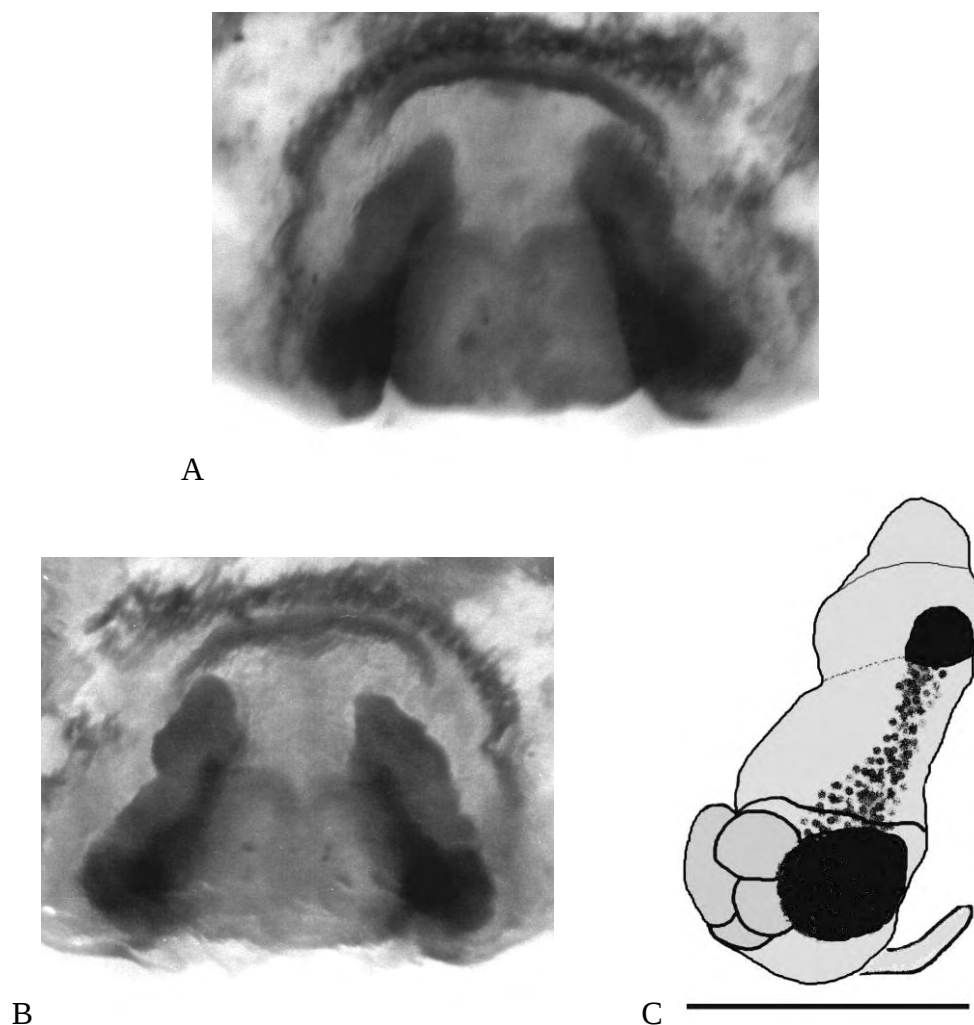


Fig. 3. *Eresus semicanus* Simon, 1908 ♀ (MNHN).
 A. Epigynum photograph, ventral view. B. Vulvae photograph, dorsal view.
 C. Left vulva, dorsal view. Scale = 0.25 mm.

Distribution: Egypt: Alexandria (about 31°11'08"N 29°53'30"E), Mariout, Suez (Simon, 1908 & 1910). This species is only recorded from Algeria and Tunisia by Roewer (1954: 1295) and Platnick (2004). The following note corrects this distribution.

Note. The female specimen of *E. semicanus* (MNHN) from Birine, Algeria, bottle no.471 (tube no. AR 842) and the female and juvenile specimens of *E. petagnae* (MNHN) from Djerba, Tunisia, bottle no.471 (tube no. AR 835) do not belong to this species. They belong to another species which may be undescribed yet.

Note on colouration. The colours of this species' specimens had changed during more than 90 years in alcohol. Therefore, it is necessary to refer to the description of Simon (1908 & 1910), from which the following translation is adopted:

Male: Cephalothorax black, covered by blackish grey hairs, mixed on the rear of cephalic part with very short red hairs and on the thoracic part with long white scattered hairs (thoracic part sometimes with marginal red hairs). Abdomen black, pubescent, covered by black hairs, decorated above by two large bands or by two sets of spots formed of mixed white and red hairs, and below by white hairs. Chelicerae black with sparse white hairs. Legs black, covered by black hairs; femora, patellae, tibiae and

metatarsi apically with wide white rings. Pedipalp small, black; femur and patella apically with white rings, the process of bulb unequally bifid. Posterior median eyes nearly six times larger than the anteriors.

Female: Black. Cephalothorax covered by black hairs and sprinkled with very small white points formed of very short thick hairs, depressed and acute. Clypeus and chelicerae, at least in their basal half, densely covered by white or pale yellow hairs. Abdomen with short black silky pubescence, mixed of some white hairs, sigilla with fine white borders. Legs black, decorated by white hairs at the joints.

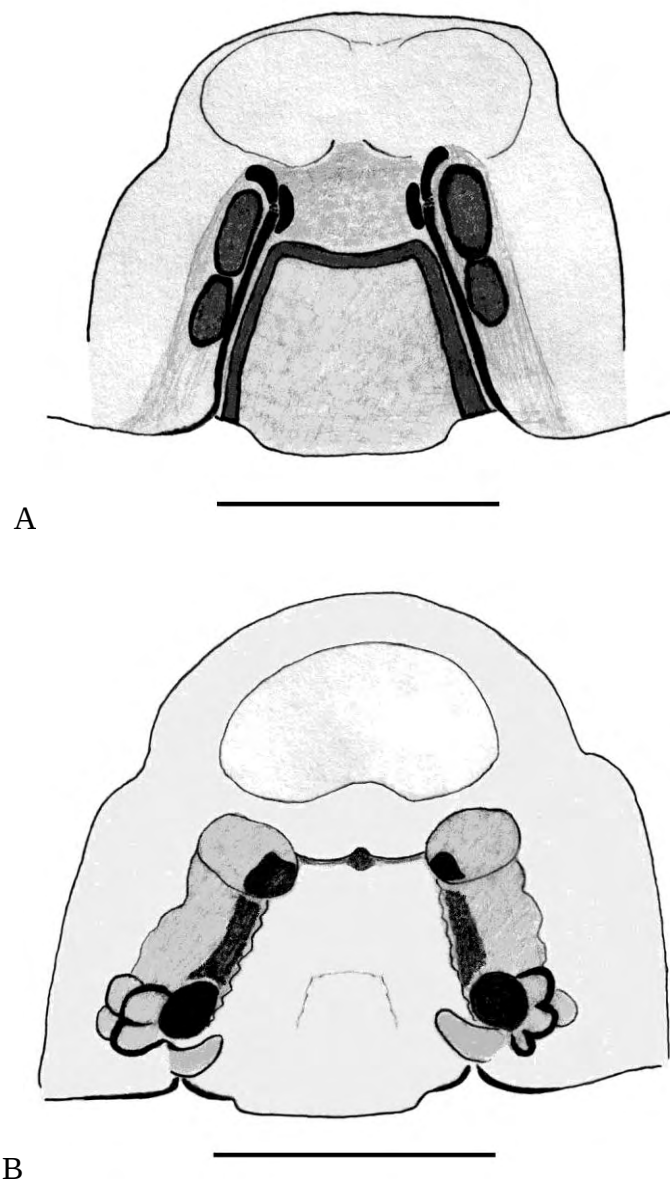


Fig. 4. *Eresus semicanus* Simon, 1908 ♀ (UMO).
A. Epigynum, ventral view. B. Vulvae, dorsal view. Scale = 0.5 mm.

Species Inquirendae

***Eresus petagnae* Audouin, 1825**

Eresus petagnae Audouin, 1825: 151, pl.4, f.11; 1827: 375-376, pl.4, f.11. Simon, 1873: 357. Cambridge, 1876: 554. Simon, 1884: 326.

This species is recorded from Egypt and Syria (Palestine ?) by Roewer (1954: 1295) and Platnick (2004) depending on some of the following references:

1. Audouin (1825 & 1827) stated in his brief diagnosis that “this species is analogous to *Eresus frontalis* Walckenaer because of the arrangement and size of eyes, but it essentially differs by lesser number of deep points on dorsal side of the abdomen; they are only six. The other differences may be in colours.” His drawn specimen seems juvenile as Simon (1910: 294) stated. It may be *E. semicanus*, *E. pharaonis*, or perhaps *Dorceus quadrispilatus* Simon, 1908 (Simon, 1910).

2. Walckenaer (1837: 397) considered *E. petagnae* and *E. theis* synonyms to *E. imperialis*. (= *E. cinnaberinus frontalis* Latreille, 1819 in Platnick, 2004).

3. Simon (1873) said that “This species seems to be fairly common in Egypt and Syria. M. Ch. de la Brûlerie brought to me a fairly great number of specimens, but no one exactly adult.”

4. Cambridge (1876) found adult and immature females of this species under stones near Alexandria. “But for M. Simon's opinion (... 1873, p. 357), I should have considered this species to have been identical with *Eresus imperialis* Duf. (= *E. frontalis*, Latr.)” (= *E. cinnaberinus frontalis* Latreille, 1819 in Platnick, 2004).

[The specimens of Cambridge are deposited in UMO. They are 2 females and 3 juveniles. They belong to *E. semicanus* Simon, 1908.]

5. Simon (1884) mentioned that *E. petagnae* is widely distributed in Egypt and Syria.

6. Simon (1908: 83) stated that the Egyptian species *Eresus semicanus* Simon, 1908 is also found in Tunisia at the isle of Djerba and that it is the species which he wrongly spoke about under the name of *Eresus petagnae* in 1884, p.326 (line 12) ?.

[These specimens of Djerba (MNHN) do not belong to *E. semicanus* but to an undescribed species.]

The first description is brief and based as most of the other following descriptions on juvenile specimens. The adult material of Cambridge (1876) and Simon (1884) belong to other species. *Eresus petagnae* has to be considered *nomen dubium*.

***Eresus pulchellus* Lucas, 1864**

Eresus pulchellus Lucas, 1864: 29. Simon, 1908: 81; 1910: 289. Roewer, 1954: 1296. Platnick, 2004.

Lucas (1864) proposed three names of new *Eresus* species: *E. siculus* from Sicily (= *Eresus walckenaeri* Brullé, 1832), *E. pulchellus* from Nubia, and *E. albo-marginatus* from Senegal. The three names were accompanied by very short diagnoses with a note that their descriptions will be published later. He based his diagnosis of *E. pulchellus* on a female specimen collected by M. P.-E. Botta from Nubia, as follows: “Very small, distinguished from known species by the yellowish longitudinal stripe which goes over its abdomen dorsally along its length. Length 10 mm.”

Simon (1908: 81 & 1910: 289) said that *E. pulchellus* is probably the male of *Stegodyphus niloticus*. (= *S. dufouri* (Audouin, 1825)). This species is mentioned by Roewer (1954: 1296) from Nubia and by Platnick (2004) from Egypt. The absence of description and the unavailability of specimens of this species make it impossible to state the true identity of this species. It has to be considered *nomen nudum*. Also, *E. albo-marginatus* Lucas, 1864 of Senegal has the same situation.

Doubtful Record

***Eresus walckenaeri* Brullé, 1832**

This species is recorded by Roewer (1954: 1296) from East Mediterranean countries and Turkestan and by Platnick (2004) as a Mediterranean species. Pavesi (1878: 389) mentioned that the distribution of *Eresus theisii* Brullé is Turkey, Syria, Egypt in addition to Greece. He stated that all the eresid species mentioned in his work, including *E. Petagnae* and *E. Theisii* are very similar, if not identical.

[*E. theis* Brullé, 1832 = *E. walckenaeri* Brullé, 1832 (Platnick, 2004)]

There is no definite locality of this species from Egypt in literature and no available specimens of it from Egypt in the consulted collections. It is here considered a doubtful record from Egypt.

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* This is the oldest title of this note which had no original title. It was mentioned in this form in p. 260 of: *Tables générales des Annales de la Société Entomologique de France 1861-1880* Paris [1885]. Rédigées par M. Ed. Lefèvre.

It was also mentioned in Roewer's "Katalog der Araneae" (1942, p.17) as:
[Note sur trois *Eresus*. *Ann. Soc. ent. Fr.* (4) 4(Bull.): 28-29.] and by Platnick (2004) as:
[Sur trois nouvelles especes d'*Eresus*.].